

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
7 September 2001 (07.09.2001)

PCT

(10) International Publication Number  
WO 01/65816 A3

(51) International Patent Classification<sup>7</sup>: H04M 3/30.  
11/06

(21) International Application Number: PCT/US01/06454

(22) International Filing Date: 28 February 2001 (28.02.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
09/516,345 1 March 2000 (01.03.2000) US

(71) Applicant: TURNSTONE SYSTEMS, INC. [US/US]:  
2220 Central Expressway, Santa Clara, CA 95050 (US).

(72) Inventors: CHEA, Ramon, C., W., Jr.: 6484 Deer Hollow  
Drive, San Jose, CA 95120 (US). DUFFIE P., Kingston:  
4059 Second Street, Palo Alto, CA 94306 (US).

(74) Agents: JAKOPIN, David, A. et al.: Pillsbury Winthrop  
LLP, 1100 New York Avenue N.W., Washington, DC 20005  
(US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ,  
DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,  
HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,  
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,  
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,  
TR, TT, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian  
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European  
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,  
IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF,  
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

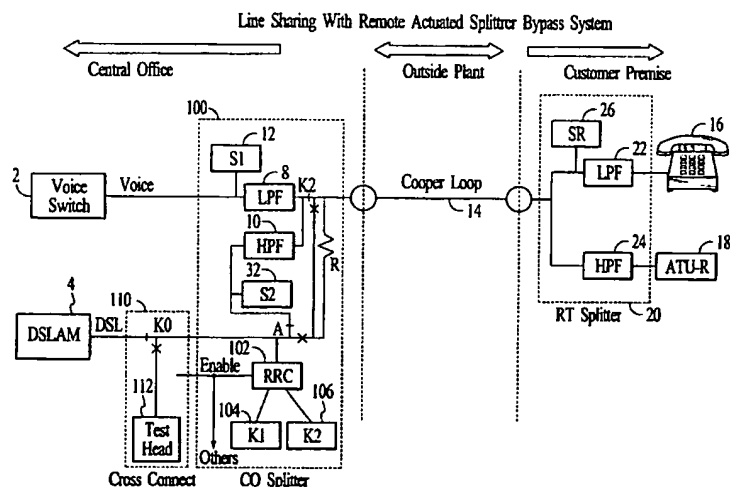
Published:

- with international search report
- before the expiration of the time limit for amending the  
claims and to be republished in the event of receipt of  
amendments

(88) Date of publication of the international search report:  
2 May 2002

For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: REMOTELY ACTUATED SPLITTER BYPASS SYSTEM AND METHOD



(57) Abstract: The present invention is directed to a remotely actuated splitter bypass function (RASB) working in conjunction with a test head at the central office for testing and maintaining copper loops in the digital subscriber line environment. The RASB allows a competitive local exchange carrier to test and maintain the xDSL portion of the copper loop with minimal interference and disturbance to/from the plain old telephone system (POTS) service by bypassing the central office splitter. The splitter bypass operation includes the steps of selecting a copper loop pair for testing, actuating a first relay for monitor mode, actuating a second relay for bypass mode, testing the selected copper loop, and resetting the first and second relays back to normal mode. By applying positive and negative voltages from the tip and ring with respect to ground, various relays can be set (actuated) and reset to provide multiple modes of operations. In this manner, relays can be designed to respond in certain voltage levels and polarities.

WO 01/65816 A3

# INTERNATIONAL SEARCH REPORT

In national Application No

PCT/US 01/06454

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 H04M3/30 H04M11/06

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC, IBM-TDB, COMPENDEX

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, A	US 6 144 735 A (BELLA GREGORY L) 7 November 2000 (2000-11-07) abstract; figure 2 column 4, line 17 -column 5, line 45 ----	1-60
P, A	US 6 091 722 A (DUNN JAMES E ET AL) 18 July 2000 (2000-07-18) abstract; figure 2 column 2, line 18 -column 3, line 38 -----	1-60

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- \*Z\* document member of the same patent family

Date of the actual completion of the international search

6 March 2002

Date of mailing of the international search report

14/03/2002

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax (+31-70) 340-3016

Authorized officer

Willems, B

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/06454

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 6144735	A	07-11-2000	US	6115466 A	05-09-2000
			EP	0942578 A2	15-09-1999
US 6091722	A	18-07-2000	US	6058110 A	02-05-2000
			US	6002681 A	14-12-1999